

Summary

According to an aspect of the present invention, there is provided an automated method for controlling environmental parameters in a defined environment. The method comprises the steps of measuring values of temperature, relative humidity, and wind velocity in the environment, converting values of temperature measured at corresponding values of relative humidity to values of perceived temperature at a constant reference value of relative humidity, and controlling the environmental parameters based on the values of perceived temperature.

The method may comprise the further steps of calculating an optimum perceived temperature based on the age of the chickens, and calculating hot and cold stress limits for the chickens based on the optimum perceived temperature.

The method may still further comprise the step of calculating stress levels experienced by the chickens, wherein the stress levels are calculated as a function of the hot and cold stress limits and the values of perceived temperature.

The method may yet further comprise the step of calculating a value of accumulated stress of said chickens during a production cycle.

According to another aspect of the present invention, there is provided an apparatus for controlling environmental parameters in a defined environment. The apparatus comprises a memory unit for storing data and instructions to be performed by a processing unit and a processing unit coupled to the memory unit. The processing unit is programmed to obtain measured values of temperature, relative humidity, and wind velocity relating to the environment, convert values of temperature measured at corresponding values of relative humidity to values of perceived temperature at a constant reference value of relative humidity, and provide the calculated values of perceived temperature for controlling the environmental parameters.

In yet another aspect of the present invention, there is provided a computer program product comprising a computer readable medium having a computer program recorded therein for controlling environmental parameters in a defined environment. The computer program product comprises computer program code means for measuring values of temperature, relative humidity, and wind velocity in the environment, computer program code means for converting values of temperature measured at corresponding values of relative humidity to values of perceived

temperature at a constant reference value of relative humidity, and computer program code means for outputting the calculated values of perceived temperature for controlling the environmental parameters.

Other aspects of the present invention provide an automated method, an apparatus and a computer program product for controlling environmental parameters in a chicken house. The method comprises the steps of measuring values of temperature, relative humidity, and wind velocity in the chicken house; determining wind chill as a function of said measured values of temperature and wind velocity, and at least one characteristic of chickens in said chicken house; determining values of perceived temperature at a constant reference value of relative humidity as a function of corresponding wind chill-compensated values of temperature measured at corresponding values of relative humidity and at least one characteristic of chickens in said chicken house; and controlling the environmental parameters based on the values of perceived temperature. The apparatus and computer program product are used to perform the foregoing method.

Brief Description of the Drawings

Features and preferred embodiments of the present invention are described hereinafter, by way of example only, with reference to the accompanying drawings in which:

Fig. 1 is a block diagram of a system for monitoring and controlling environmental parameters;

Fig. 2 is a flow diagram of a method for environmental control;

Fig. 3 is a flow diagram of a method for environmental control in a chicken house; and

Fig. 4 is a graph of temperature as a function of relative humidity showing standard heat index curves for human comfort levels.

Detailed Description

Embodiments of methods and apparatuses are described hereinafter for monitoring and controlling environmental parameters. While the methods and apparatuses are described with specific reference to environmental control in a chicken house, it is not intended that the present invention be limited to such application as the principles of the present invention have general applicability to environmental control for numerous other purposes. For example, embodiments of the present invention may be applied to agricultural environments for the production of various animals and plants. Embodiments of the present invention may also be practised to control human comfort levels.

As stated hereinbefore, a difficulty exists in unifying environmental parameters in a single solution due to the complexity of the standard heat stress equation.

Within the continuum of values that the standard heat stress equation generates, there exists a locus of points on which the heat stress index (otherwise known as the perceived temperature) is equal to the measured temperature. However, the individual points relate to different values of humidity. A practical unified solution is aided when the points on the locus, at which the measured temperature equals the perceived temperature, occur at a constant value of humidity. For convenience, this value may be defined as the 50% point of relative humidity where the measured temperature